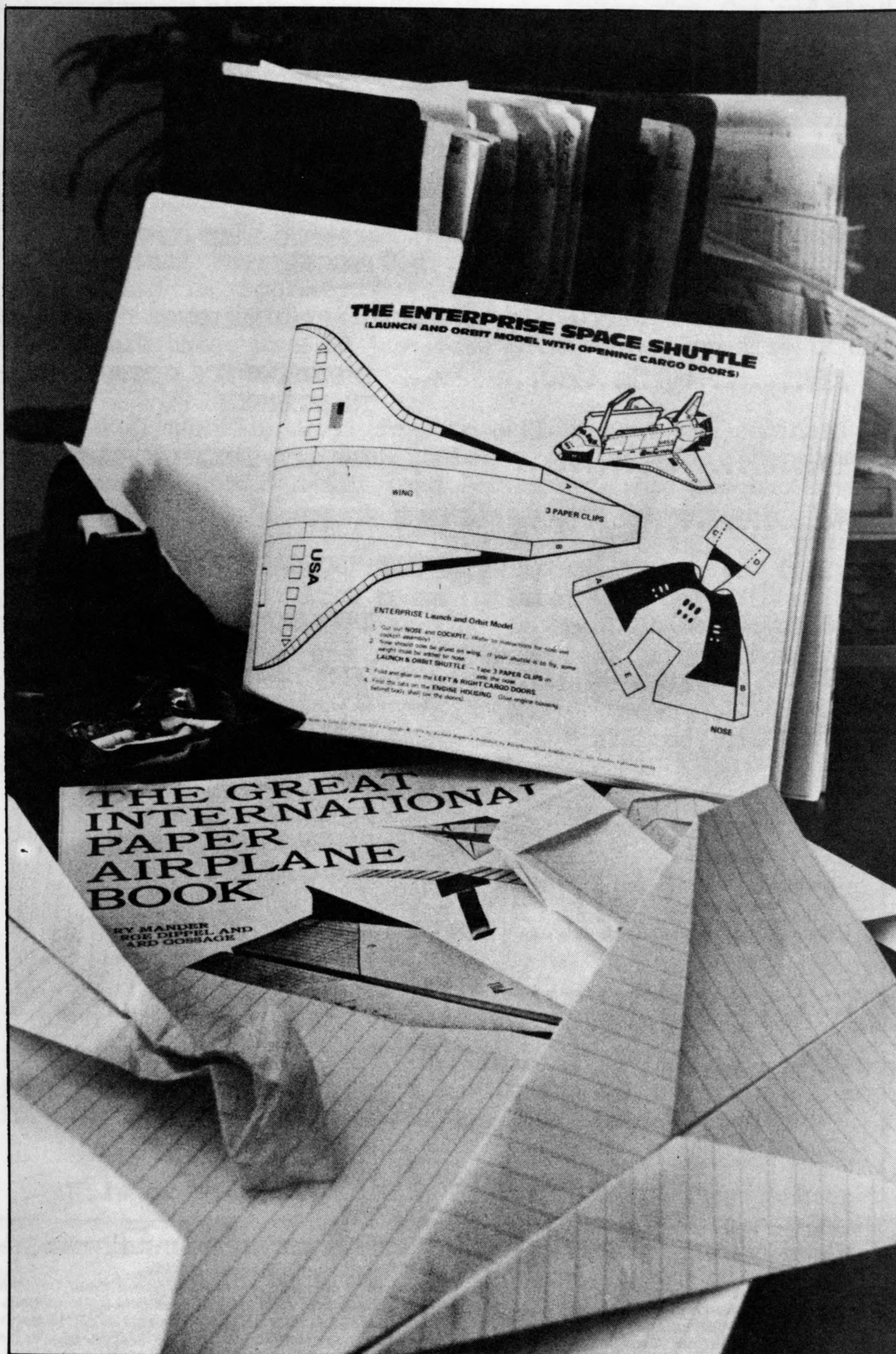


# colorcue

a publication for CompuColor users · v. 3, · # 5 · may 1980 \$1



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- COMMUNITY ACCESS BULLETIN BOARDS
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# colorcUE

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### ENCLOSURES

CONFERENCE PRE-REGISTRATION FORM

SPECIAL INVENTORY SURPLUS SALE

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## editor's letter

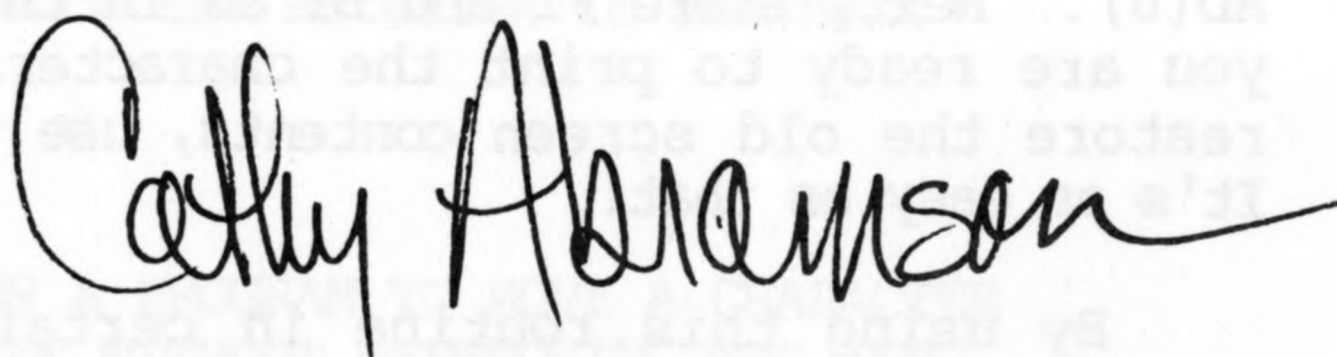
Paper airplanes are no longer just the simple fold 'em up type that I remember as a school girl -- they're a science. Our cover features **The Great International Paper Airplane Book** by J. Mander, G. Dippel, and H. Gossage published by Simon & Schuster in 1967 following the First International Paper Airplane Competition sponsored by **Scientific American**, and **The Enterprise, Columbia Space Shuttles to Color, Cut Out and Fly!** by Richard Wagner, published by Price, Stern, & Sloan, 1979.

If you are wondering about my newly acquired fascination with paper airplanes, see our cover story on the Huntsville User Group, page 6. The Huntsville Group is comprised of individuals singularly attracted to airborne things.

Announcing plans for the First Compucolor/Intecolor International User Group Convention. The Georgia Compucolor User Group is sponsoring the first combined user group convention to be held here in Atlanta, July 18 through 20. The fee for all three days is just \$50. The convention site is the Perimeter North Inn.

The Convention will feature a Plant Tour and seminars on all your favorite topics: color graphics, file handling, interfacing, basic BASIC, and Assembly. And who knows what else could be in store at the First Users Convention? I have enclosed a pre-registration form in this issue. If you are interested in attending, it is very important that you fill out that form and get it back to me no later than July 7th so that I can block off enough space at the hotel to accomodate you. When I receive your pre-registration form, I will send you a complete packet of convention and hotel information.

Make plans now to meet your fellow users and join the fun! I'll see you there.



---

rem

Here's an article by Tom Hudson of Springfield, MO. Tom is interested in contacting any Compucolor users in his area for information exchange.

**EDITOR'S NOTE**

This program demonstrates a routine that allows a user to move characters around on the Compucolor screen without destroying the information already resident on the screen. It will work with any color or character, even graphics.

**SCREEN SAVER**

By Tom Hudson  
2369 E. Seminole  
Springfield, MO. 65804  
(417) 883-0727  
or 493-8222

The routine works by coding the X and Y cursor positions into a memory address and moving the contents to FI (Foreground



Info) and BI (Background Info). FI contains the ASCII value of the foreground character. BI contains the color information for the screen position. After these values are saved, the routine is able to print the desired character at the desired location (in this case , PX and PY). The routine delays for a short time, and then restores the old screen contents by POKEing FI and BI back into screen memory.

I needed this routine for a war game I am writing. The program draws an intricate world map, and attack satellites are moved around the screen. Without this routine, the satellites would quickly destroy the map, and I'd have real trouble. By using this routine, I can move the satellites without messing up the graphic display.

One operating note: This routine will NOT work if the screen has been scrolled. To avoid this, I use an ERASE PAGE, followed by an (ESC)X (which sets up the PAGE mode, and prevents the screen from scrolling up). Normally, you will only be using this routine on non-scrolling displays, so you should have no problem.

**EDITOR'S NOTE** (Another solution would be to add PLOT 27,88:LOAD, name of program:RUN in the program.)

To use the routine, clear the screen and put any type of display on it (make sure the screen has not scrolled!). A good display to use for this is the High Resolution 3-D Blocks display from the graphics issue of COLORCUE (Vol. 3, #2, Feb. 1980). After the display is on the screen, load this program and RUN it. A red asterisk will move itself around the screen, and the display won't be damaged.

To adapt this technique to one of your programs, use lines 40, 70 and 100. BEFORE printing the character, move the X and Y coordinates to the PX and PY variables and execute AD = FN AD(0). Next, store FI and BI as in the routine line# 70. Now you are ready to print the character. When you are ready to restore the old screen contents, use the coding in line# 100. It's as easy as that!

By using this routine in certain games, you can make displays as complicated as you like, without worrying about ruining them.

If anyone has any questions or comments, please feel free to call or write.

LINE#	FUNCTION
-------	----------

10	This line sets up the initial values of PX and PY, the screen X and Y locations of the character to be moved around. It also sets up the XI and YI variables. These are used to increment the PX and PY values so the character will move.
----	--



20 This line sets up the address function that finds the address of the screen position indicated by PX and PY.

40 This line increments PX and PY to the next screen position.

50-60 These lines check to see if the PX and PY values have gone beyond the acceptable ranges. If so, the increments are negated.

70 This line finds the memory location for the current position of the character. Using this information, the program retrieves the information about the character currently on the screen and stores them in the FI and BI variables. BI holds the color status information. FI holds the ASCII character value.

80 Now that the old information is stored, it is O.K. to print your character. This line plots an asterisk using the blind cursor mode. Any other character could be plotted in this manner.

90 This line is a simple time-delay loop, so you can see the asterisk.

100 This line restores the old information into the screen memory. It merely POKES the original FI and BI values back into their respective locations.

110 Now the program goes back to line 40, so it can advance the asterisk to the next position.

#### LIST

```

1 REM THIS ROUTINE ALLOWS A PROGRAM TO MOVE A CHARACTER
2 REM AROUND ON THE SCREEN WITHOUT DESTROYING THE INFO
3 REM ALREADY ON THE SCREEN.
4 REM
10 PX= 32:PY= 16:XI= 1:YI= 1:REM SET UP X&Y VALUES, INCREMENTS
20 DEF FN AD(A)= 28672+ PX* 2+ PY* 128
30 REM ADDRESS FIND FUNCTION
40 PX= PX+ XI:PY= PY+ YI:REM INCREMENT X & Y TO NEXT POSITION
50 IF PX< 0OR PX> 63THEN XI= -XI:PX= PX+ XI
60 IF PY< 0OR PY> 31THEN YI= -YI:PY= PY+ YI
70 AD= FN AD(0):FI= PEEK (AD):BI= PEEK (AD+ 1)
71 REM GET FOREGROUND AND BACKGROUND INFORMATION
80 PLOT 3,127,PX,PY,1,42:REM PLOT AN '*' IN BLIND CURSOR MODE
90 FOR N= 1TO 50:NEXT :REM DELAY A BIT
100 POKE AD,FI:POKE AD+1,BI:REM RESTORE OLD SCREEN CONTENTS
110 GOTO 40:REM NEXT POSITION
READY

```





Steering the conversation over to things which are not airborne is impossible with this group. As we get ready to take formal shots of the Group (which somehow **never** work out!) Wubbo clowns, giving a semi-serious lecture of the, no doubt, superior abilities of his paper airplane!

From left to right, they are Stephan Bernhardt, Dick Heckman, Jim Perkins, Tony O'Neil, Wubbo Ockles, Eike Mueller, Jim Horwitz, Jim Green, Chuck Lewis, and Jeff Riggs.

## A VISIT HUNTSVILLE'S

One of Compucolor's most unique groups has formed in Huntsville, Alabama, nestled between the foothills of the Appalachian mountains and the Redstone rockets.

The Huntsville User Group is entirely made up of NASA and ESA (the European Space Agency) Compucolor users, all working on the Space Lab project. It's a group with a distinct international flavor, using their machines for a wide variety of ordinary and not-so-ordinary activities. Like the rest of us, there's a wide variety of levels of expertise from just beginning to quite advanced. However, the homogeneity of their work relationships makes this group quite a contrast from most of the other groups I've seen.

The Group collected bright and early on April 26th at the home of the Group's President, Eike Mueller. First on the agenda was a demonstration of displays given by Wubbo Ockles. Dr. Ockles is a physicist by trade and a Payload Specialist by occupation. A Payload Specialist is what we used to call, in a more romantic age, an astronaut. Space Lab's Payload Specialists, 2 Americans and 3 Europeans, will be conducting a wide variety of scientific experiments while the lab is in orbit.

Wubbo and his two European counterparts are using their recently purchased CCII to simulate the experiment displays that they will be using on the mission. These displays replicate the on-board computer displays that they will actually be using. They are sending the displays back and forth to each other for training.

Eike, the NASA/ESA Liaison, demonstrates a project scheduling program which marks General Milestones

Onto serious matters, Wubbo demonstrates his Space Lab experiment simulation displays to the great interest of the Group.





for American and European activities. Tony O'Neil, head of Ground Operations, is particularly interested in this one -- just like everywhere else, apparently scheduled completion dates change frequently.

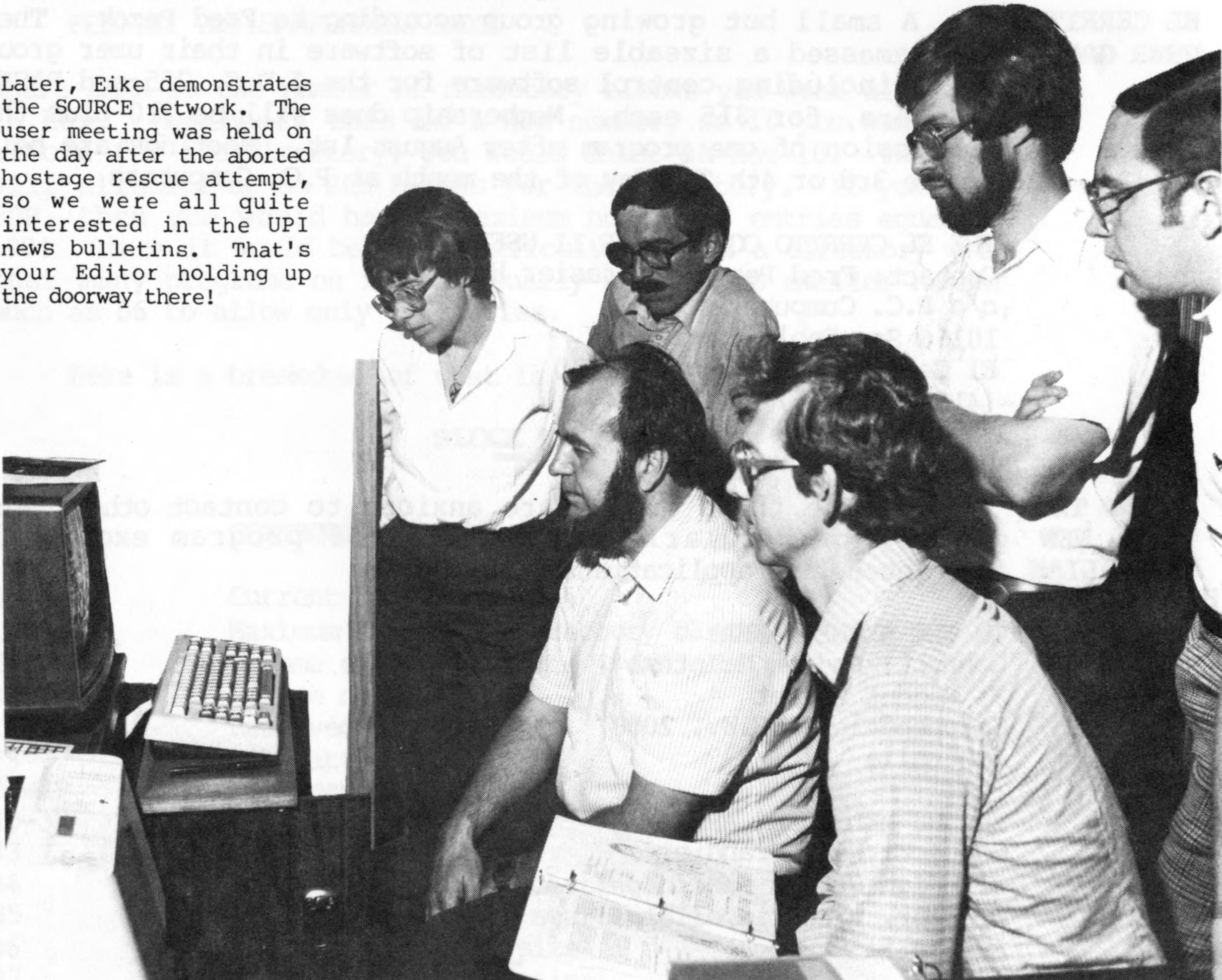
Photos  
by Dennis Keim

## WITH COMPUNAUTS

Eike formats this information with his Vu-Graph program, prints it out on his Paper Tiger printer, and uses the output to make transparencies for the inevitable Monday Morning Meeting. (By the way, these programs are pretty generalized and could be converted for most environments. Contact Eike if you are interested.) Eike can even plot a graph with the original projected dates, new projected dates, and final completion dates to help plan more realistic target dates in the future. On the personal side, he has developed a program to arrange and rearrange the floor plan of his home or office.

Several hours after the meeting began, the Group drifted home only to regroup at Eike's that evening for an incredible German-style barbecue. "A good time had by all" sounds hollow compared to the experience! Call or visit, it's worth the trip. Now that I have friends in high places, maybe I'll get to write a future issue of **COLORCUE** from space?

Later, Eike demonstrates the SOURCE network. The user meeting was held on the day after the aborted hostage rescue attempt, so we were all quite interested in the UPI news bulletins. That's your Editor holding up the doorway there!





## user group hotline

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### MORE GROUPS!

A new group is forming in the south Massachusetts -- Connecticut area. For further information contact:

### NEW USER GROUP FORMING IN MASS./CONN. AREA

Richard Manazir  
13 Grandview Street  
Southwick, Mass. 01077  
Phone: (Day) (203) 688-1911 x4716  
(Night) (413) 569-6621

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### CANADIAN USER GROUP

The Canadian User Group meets once every 2 months on the last Tuesday of the month at different locations near metropolitan Toronto. Fees are \$15.00 per year which includes a newsletter (still un-named). There are currently about 55 members.

### CANADIAN USER GROUP

Contact: Glen Davis, President  
Bsmt-59 Kendal Avenue  
Toronto, Ontario  
Canada, M5R 1L8

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### EL CERRITO USER GROUP

A small but growing group according to Fred Pezok. They have amassed a sizeable list of software in their user group file, including control software for the I.D.S. 225 and BASE2 printers, for \$15 each. Membership dues will be \$10 plus the submission of one program after August 1st. Meetings are held on the 3rd or 4th Tuesday of the month at P.C. Computers.

### THE EL CERRITO COMPUCOLOR II USERS GROUP

Contact: Fred Pezok or Frasier Hewitt  
c/o P.C. Computers  
10166 San Pablo Avenue  
El Cerrito, California 94530  
(415) 527-6657

=

### AND TWO NEW AUSTRALIAN USER GROUPS

Both of these groups are anxious to contact other user groups, particularly in the area of program exchange, techniques, and applications.

### IN THE SYDNEY AREA:

Contact: Andrew McIntosh  
91 Regent Street  
Chippendale, N.S.W., 2008  
Australia

### IN THE MELBOURNE AREA:

Contact: Neil Brandie  
212 High Street  
Windsor, Victoria, 3181  
Australia

=



Brian Cruse has just put out his first issue of the **Australian COLORCUE** in April. The subscription rate is \$1 per issue. For further information contact:

Brian Cruse  
8 Ulva Street  
Bald Hills, Queensland 4036  
Australia

=

## keeping it simple

How many of you out there have ever wondered how Compucolor builds their disk directories? Fortunately for us, the Compucolor's disk directory is set up so that it contains everything you need to know about a disk file. Let's take a closer look at how it is constructed.

As most of you know, the CCII allows you 400 (190H) blocks of disk space, with each block containing 128 bytes. When a disk is initialized, a specific portion of the disk is allocated to directory space. This is done by using the following command:

```
FCS>INI CD0:SAMPLEDISK XXXX
```

where XXXX is the number of directory blocks you want allocated in hex. Remember, this is a hex number, so if you wanted 10 blocks for the directory, you would enter 0A not 10. The CCII will allocate up to 20H blocks for the directory. If you used 20H, then you would have a maximum number of entries equal to 190! Since it would be very difficult to read a directory with that many programs on it, we usually use a much smaller number such as 06 to allow only 34 entries.

Here is a breakdown of what is on each block:

### BLOCK 0

BYTE	CONTENTS
0	Current Block
1	Maximum number of directory blocks
2	Volume entry attribute (=41H)
3-12	Volume name (ASCII)
13-22	Reserved
23	File attribute
24-29	File name (ASCII)
30-32	File type (ASCII)
33	Version number in hex
34	Low order byte of starting block
35	High order byte of starting block
36	Low order byte of size
37	High order byte of size

**OTHER NEWS**  
**"DOWN UNDER"**

**DISSECTING**  
**A**  
**DIRECTORY**

By Dennis Martin  
P.O. Box 4037  
Omaha, Nebraska 68104  
(402) 453-6826



38	Last block count
39	Low order byte of loading address
40	High order byte of loading address
41	Low order byte of starting address
42	High order byte of starting address
43	Reserved
44-64	Same as 23-43 above
65-85	Same as 23-43 above
86-106	Same as 23-43 above
107-127	Same as 23-43 above

#### BLOCKS 1 THROUGH XX

BYTE	CONTENTS
0	Current block
1	Maximum number of directory blocks
2-22	Same as 23-43 on Block 0
23-43	Same as 23-43 on Block 0
44-64	Same as 23-43 on Block 0
65-85	Same as 23-43 on Block 0
86-106	Same as 23-43 on Block 0
107-127	Same as 23-43 on Block 0

All entries in the Directory (except the first and last) are structured identically. The first entry contains the disk name, and the last entry contains the free space entry. That is why the formula for finding the number of entries allowed is:  $XX * 6 - 2$ .

It is very important to remember that when altering anything in the Directory, you have to alter it a block at a time. This means that if all you want to change is the 10 character disk name, you must read in the entire 128 bytes of block 0, or you can ruin a disk.

By means of a utility program, it is also possible to alter the attribute byte, program name, file type, version, and even the loading address of any file. It is also possible to create a protected file that cannot be deleted from the disk.

A final word of caution. Use extreme care whenever attempting to change anything on the disk with the WRITE command. Severe and often irreparable damage can be done to a disk through careless use of this command. For those of you that want to experiment, try using a blank disk. It could save you a lot of headaches.



The following program allows you to convert from decimal, hexadecimal, octal or binary into the other bases. The number to be converted is entered as a string, converted to a positive integer and then all of the results are calculated. This allows quick verification of the algorithm. The program should be self-explanatory.

**NUMERIC  
BASE  
CONVERSION  
PROGRAM**

```

10 REM ***** NUMERIC BASE CONVERSION PROGRAM *****
15 REM
20 REM ** WRITTEN BY: WIZARD #6
25 REM ** TECHNICAL ADVISORS: WIZARDS #1, #3, AND #7
30 REM
35 REM ** LAST REVISED: MAY 18, 1980 WIZ #6
40 REM
45 REM
50 CLEAR 1000
100 CC$= "0123456789ABCDEF"
200 PLOT 6,3 : PRINT : INPUT "BASE (D,H,O,B) = ";NB$
205 PLOT 6,2
210 IF NB$= "D" THEN GOTO 2000
220 IF NB$= "H" THEN GOTO 3000
230 IF NB$= "O" THEN GOTO 4000
240 IF NB$= "B" THEN GOTO 5000
250 GOTO 200
260 REM
2000 REM ** DECIMAL **
2005 NB= 10
2010 PRINT : INPUT "DECIMAL NUMBER = ";D$
2020 IF D$= "" THEN GOTO 200
2030 IF LEN (D$)> 5 THEN GOTO 2010
2040 SD$= D$
2050 GOSUB 6000
2060 IF SD$= "" THEN GOTO 2010
2070 GOSUB 7000 : REM CALCULATE STRINGS
2080 GOSUB 8000 : REM PRINT STRINGS
2090 GOTO 2010
2095 REM
3000 REM ** HEXADECIMAL **
3005 NB= 16
3010 PRINT : INPUT "HEXADECIMAL NUMBER = ";H$
3020 IF H$= "" THEN GOTO 200
3030 IF LEN (H$)> 4 THEN GOTO 2010
3040 SD$= H$
3050 GOSUB 6000
3060 IF SD$= "" THEN GOTO 3010
3070 GOSUB 7000 : REM CALCULATE STRINGS
3080 GOSUB 8000 : REM PRINT STRINGS
3090 GOTO 3010
3095 REM
4000 REM ** OCTAL **
4005 NB= 8
4010 PRINT : INPUT "OCTAL NUMBER = ";O$
4020 IF O$= "" THEN GOTO 200
4030 IF LEN (O$)> 6 THEN GOTO 4010
4040 SD$= O$
4050 GOSUB 6000
4060 IF SD$= "" THEN GOTO 4010
4070 GOSUB 7000 : REM CALCULATE STRINGS

```



```

4080 GOSUB 8000 : REM PRINT STRINGS
4090 GOTO 4010
4095 REM
5000 REM ** BINARY **
5005 NB= 2
5010 PRINT : INPUT "BINARY NUMBER = ";B$
5020 IF B$= "" THEN GOTO 200
5030 IF LEN (B$)> 16 THEN GOTO 5010
5040 SD$= B$
5050 GOSUB 6000
5060 IF SD$= "" THEN GOTO 5010
5070 GOSUB 7000 : REM CALCULATE STRINGS
5080 GOSUB 8000 : REM PRINT STRINGS
5090 GOTO 5010
5095 REM
6000 REM ** CONVERT FROM A STRING TO A POSITIVE INTEGER **
6020 SL= LEN (SD$)
6025 X= 0
6030 FOR I= 0 TO SL- 1
6040 SC$= MID$ (SD$,SL- I,1)
6050 FOR J= 1 TO 16
6060 IF SC$= MID$ (CC$,J,1) AND J<= NB THEN GOTO 6100
6070 NEXT J
6080 PRINT : PRINT "*** INVALID CHARACTER '";SC$;"' ***"
6083 PRINT .
6085 SD$= "" : REM FLAG ERROR
6090 RETURN
6095 REM
6100 X = X + ((J- 1)* (NB^ I))
6110 NEXT I
6115 X= INT (X+ .5) : REM CONVERT TO INTEGER
6120 RETURN
6130 REM
7000 REM ** CALCULATE STRINGS FOR DIFFERENT BASES **
7010 BB= 10 : XX= X : GOSUB 9000
7020 DD$= NS$
7030 BB= 16 : XX= X : GOSUB 9000
7040 HH$= NS$
7050 BB= 8 : XX= X : GOSUB 9000
7060 OO$= NS$
7070 BB= 2 : XX= X : GOSUB 9000
7080 BB$= NS$
7090 RETURN
7095 REM
8000 REM ** PRINT THE CONVERSIONS **
8010 PRINT "DEC = ";DD$,"HEX = ";HH$,"OCT = ";OO$,"BIN = ";BB$
8020 RETURN
8030 REM
9000 REM ** CONVERT TO DESIRED BASE **
9010 NS$= ""
9020 XQ= INT (XX/ BB):XR= XX- (BB* XQ)
9030 XX= XQ
9040 NS$= MID$ (CC$,XR+ 1,1)+ NS$
9050 IF XX<> 0 THEN GOTO 9020
9060 RETURN
9070 REM

```



Glen Hayhurst, has sent in a hexadecimal to decimal conversion program for a programmable calculator, the HP 33E. He will be happy to provide it to you if you are interested; please send a self-addressed stamped envelope with your request.

Glen Hayhurst  
9595 Pecos "14  
Denver, Colorado 80221

=

## advanced applications

It is often useful to be able to execute FCS commands from an assembly language program. This is provided for in the system software and very easy to implement. A simple example of this would be to have one program call another for a special function or task and then return to the original program.

### **EXECUTING FCS COMMANDS IN ASSEMBLY**

There are three routines that are used and they are FCS, EMESS, and FCSEM. FCS is the Command Interpreter and it is used by pointing H&L to the command line to be executed and then calling FCS. The command line must end with a null byte (00). The FCS routine first searches the Command Table for the command and if it is found, the command is executed. If the command is not found or if there is some other error, the routine returns with the error code in the B register and the <Z> flag cleared; otherwise B equals 00 and the <Z> flag is set.

The EMESS routine can then be called, with or without an error. If an error is present, it will be listed to the output device using the OSTR routine (which we discussed in the September/October issue). The error conditions will be preserved through EMESS. If you wish to use FCS and EMESS regardless of an error, call FCSEM with H&L pointing to the command line.

One of the powerful features of the routine FCS is that if it is called, it will return to the calling program upon completion. This is useful if a test program is very large and can't fit into the allowed memory at one time. A main routine can be written to call particular routines as they are needed to perform desired tests. When a particular test executes to completion, control is returned to the main routine which, in turn, can call another routine located in the same area as the one just completed. NOTE: The main program must not be overwritten by a called program if the called program is to return to the main by simply executing a return (RET). The main program might reside from 8200H to 83FFH and the called routine(s) be setup to load at 8400H or higher.



Another way to use the FCS routine is to chain programs together. Suppose you designed an assembler to work with a linker. Upon completion of the assembly, the assembler would execute the linker by pointing to the 'RUN LINKER' command line and then **jump** ('JMP') to the routine FCS. The linker would execute at this point. If the linker returns when it is finished, control then passes to the caller of the assembler.

Take care to preserve the stack pointer and the stack when writing a program that will return to its caller. The program cannot be entered through the user vector, ECS ^, because the proper return address is not placed on the stack. An example would be all of the Basic Utilities (except for Fredi) which were designed to be re-entered through an Escape Vector (ECS xx) and always to return to the File Control System.

This sample program illustrates the use of the routines but is not designed to perform a specific useful task.

```

;;          ***** V6.78 SYSTEM SOFTWARE *****

FCS        EQU        25ECH      ; FCS COMMAND INTERPRETER
EMESS      EQU        262DH      ; FCS ERROR MESSAGE PROCESSOR
FCSEM      EQU        262AH      ; COMBINATION OF FCS AND EMESS

;;          ***** V8.79 SYSTEM SOFTWARE *****

FCS        EQU        0A95H
EMESS      EQU        0AD6H
FCSEM      EQU        0AD3H

                ORG        0FF00H ; LOCATE AT TOP OF MEMORY

TEST:
                LXI        H,CMND02      ; COMMAND LINE FOR FCS
                CALL       FCS          ; RETURN TO HERE WHEN FINISHED
                CALL       EMESS        ; PRINT ERROR IF ANY (B<>0)

TEST2:
                LXI        H,CMND04
                CALL       FCS
                LXI        H,CMND06
                CALL       FCS          ; DON'T PRINT ERROR MESSAGE
                JNZ        TEST         ; IF ERROR RE-EXECUTE PROGRAM

TEST4:
                LXI        H,CMND08
                JMP        FCSEM        ; RETURN TO CALLER OF 'TEST'

CMND02:      DB          'DIR CD0:',0
CMND04:      DB          'DEV CD0:',0
CMND06:      DB          'COP SCRATC.RND TO CD1:',0
CMND08:      DB          'RUN MEMORY.PRG',0

                END        TEST

```



Our old friend, Bill Greene, has submitted the following driver program for use on the IBM USC 1035 I/O terminal. This terminal uses the standard RS-232 outlet.

# IBM BIT-BANGING DRIVER

By Bill Greene  
RT3 Box 00-200  
Byron, Ga. 31008

```
>ASM IBMOUT
;      IBM BIT-BANGING DRIVER
;      3/24/80  BILL GREENE

;      START IS CALLED WITH IBM CODE IN REGISTER C

8200 (BF00)      ORG      0BF00H ;OUT OF THE WAY IN HIGH MEMORY

BF00 79      START: MOV      A,C      ;PXXXXXX0 TO ACC P=PARITY 0=START BIT
;XXXXXX = IBM EBCD CODE 6-LEVEL

BF01 E5      PRINT: PUSH     H      ;SAVE SHIFT STATUS AND LINE COUNT
BF02 2609      MVI      H,9      ;BIT COUNTER-OUTPUT WILL BE 1PXXXXXX0
BF04 47      OUTBIT:MOV     B,A      ;SAVE THE BITS FOR LATER
BF05 2F      CMA      ;NEED THE COMPLEMENT FOR IBM
BF06 E601      ANI      1      ;MASK A0 ONLY, LEAST SIGNIFICANT BIT
BF08 07      RLC      ; X 2
BF09 C608      ADI      8      ; + 8
BF0B D304      OUT      4      ;MARK(8) OR SPACE(10) FOR RS232C
BF0D 110002     LXI      D,512     ;LOAD LOOP COUNTER
BF10 CD1CBF     CALL     LOOP      ;FOR 7.43MS DELAY
BF13 78      MOV      A,B      ;GET REMAINING BITS
BF14 37      STC      ;SET CARRY FOR STOP BIT(1)
BF15 1F      RAR      ;1PXXXXXX, 11PXXXXX, 111PXXXX, ETC.
BF16 25      DCR      H      ;COUNT THE BIT
BF17 C204BF     JNZ      OUTBIT    ;GET ANOTHER ONE
BF1A E1      POP      H      ;RESTORE STATUS
BF1B C9      RET      ;GO HOME

BF1C 1B      LOOP:  DCX      D      ;DECREMENT D,E REGISTER
BF1D 7A      MOV      A,D      ;LOOK AT D
BF1E FEFF      CPI      255     ;LOOKING FOR 65535, ESSENTIALLY -1
BF20 C21CBF     JNZ      LOOP      ;WASTE MORE TIME
BF23 C9      RET

BF24 7534B4F5   TABLE: DB      75H,34H,0B4H,0F5H ; IBM CODE
BF28 68C35864   DB      68H,0C3H,58H,64H ;FROM ASCII 33 TO ASCII 96
BF2C 540443F6   DB      54H,04H,43H,0F6H
BF30 81B7E2D4   DB      81H,0B7H,0E2H,0D4H
BF34 A090F088   DB      0A0H,90H,0F0H,88H
BF38 E8D8B884   DB      0E8H,0D8H,0B8H,84H
BF3C E4087010   DB      0E4H,08H,70H,10H
BF40 20386282   DB      20H,38H,62H,82H
BF44 2313730B   DB      23H,13H,73H,0BH
BF48 6B5B3B07   DB      6BH,5BH,3BH,07H
BF4C 67615131   DB      67H,61H,51H,31H
BF50 49291979   DB      49H,29H,19H,79H
```



BF54 45255232	DB	45H,25H,52H,32H
BF58 4A2A1A7A	DB	4AH,2AH,1AH,7AH
BF5C 462676E2	DB	46H,26H,76H,0E2H
BF60 76370102	DB	76H,37H,01H,02H
BF64 803C	STATUS:DB	128,60 ;SHIFT FLAG AND LINE COUNT
BF66 (BF00)	END	START

#### SYMBOL TABLE

LOOP....BF1C OUTBIT..BF04 PRINT...BF01 START...BF00 STATUS..BF64  
TABLE...BF24

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## nuts & bolts

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Electrical noise is a major problem in microcomputers. Generated within a computer itself, it can in many cases interfere with nearby radio and TV reception and even with the computer's own operation. Many unexplained microcomputer malfunctions can, in fact, be traced to the external noise. All microcomputers are more prone to electrical noise problems than large mainframe computers. Let us explore one source of noise and its effect on microcomputer operations and suggest methods of reducing or eliminating the problem.

power

Nearby lightning strikes generate spikes of the highest amplitude, but strikes a mile or more away can also cause trouble. This noise appears on an oscilloscope as a rapid-fire series of narrow, high voltage spikes. It can enter the power system either from a direct strike on power distribution equipment or by induction. Since power lines may be strung overhead for long distances, they efficiently pick up electrostatic and electromagnetic fields radiated by lightning strikes and conduct the resulting spikes into your home.

Probably the power line noise with the next highest amplitude is created by switching off an inductive appliance, allowing energy stored in the magnetic field of an inductive device to release suddenly as the field collapses. For a few dozen microseconds, a very high voltage is built up and may arc across the open switch contacts, feeding a high voltage pulse with a fast rise time into the power line. AC induction motors and transformers -- even those in fluorescent lamp fixtures -- are the most highly inductive. Large motors, such as those



used in refrigerators and air conditioners, create an electrical noise even when they switch on because an internal starting winding switches off when they reach operating speed. Industrial plants with hundreds of very large motors and transformers constantly switching on and off present particularly hostile electrical environments for computers.

While these sources are responsible for occasional high amplitude spikes on the power line, universal motors (those with brushes) and lamp dimmers generate lower amplitude, but more continuous noise. The obvious source of noise in universal motors originates with armature brushes that constantly spark during motor operation. Lamp dimmers with silicon-controlled rectifiers (SCRs) or triacs generate a small amount of noise on every alternation of the AC line because of the rapid turn-on characteristics of these semiconductors.

One might reasonably ask how power line noise can get into a computer's logic circuitry if its very narrow pulse widths cannot pass through the power transformer and rectifier diodes to actually change the DC supply voltages (large power-supply filter capacitors prevent this). Noise is capacitively coupled from the power supply's primary wiring directly into the regulated DC output wiring and then into the logic. In some computers with the primary wiring routed close to the logic circuitry, noise bypasses the power supply altogether and couples directly into the logic. It is not difficult to visualize how even a fraction of a picofarad of coupling capacitance can transfer more than 1 volt (the typical noise-immunity specification for most TTL and MOS logic) of the original 1000-volt spike into the logic circuitry and possibly cause an error. NOTE: Most computers are sensitive to noise only during part of their BUS and memory cycles; hence, it is possible for the computer to ignore the majority of noise spikes.

**Line** Preventing power line noise from entering a computer is relatively easy -- simply use a noise filter between the AC outlet and the computer's line cord. Filters are most effective if located inside the computer's cabinet, right at the point where the power cord enters. Even if installed at the plug end of the computer's line cord, however, they can be very helpful in excluding power line noise.

While filters are available from a number of sources, you might want to make your own filter circuit. A good power line filter consists basically of two L-section low-pass R-F filters (to provide both common and transverse mode noise rejection), with inductors designed to handle several amperes of continuous current. Metal-oxide varistors (MOVs) are included to prevent possible damage from direct local lightning strikes but do not otherwise contribute to filtering out noise. (MOVs act like high-power zener diodes, shorting out electrical spikes that exceed about 300-volts in amplitude.)

**noise**



A properly grounded three-wire AC outlet and computer line cord are required for any noise filter to function properly. With non-grounded outlets, filtering efficiency will be very low and current leakage through the filter's capacitors could create a mild shock hazard.

AC-line filters cannot cope with problems caused by low-frequency power surges and dips long enough in duration to affect the computer's DC voltages. The only defense against this type of noise is a wide line-voltage range computer power supply or an expensive external AC voltage regulator.

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## product showcase

### THE COMPUCOLOR MONITOR

The Compucolor Monitor disk is used to display and alter the memory contents of the Compucolor II. Commands are available providing access to memory in several ways and the command syntax is really quite simple. A command is one character followed by one or more parameters separated by spaces. There are no spaces immediately after the command character itself. The form looks like this:

**.Cxxxx yyyy zz**

**C** is the command, **xxxx** is the first parameter, **yyyy** is the second parameter, and **zz** is the third (the maximum number of parameters allowed). All parameters are in hexadecimal format.

List of the available commands and their formats:

A -- Display memory contents in ASCII.	.Assss eeee
D -- Display memory contents in hex.	.Dssss eeee
E -- Exit program, return to CRT mode.	.E
F -- Fill memory with a constant.	.Fssss eeee cc
G -- Go to memory location with optional breakpoints.	.Gssss bbbb
M -- Move memory.	.Mssss eeee dddd
S -- Substitute memory contents.	.Sssss



There are three programs included on the MONITOR disk, two LDA-type files called MONT.LOW and MONT.HGH. The two MONT files are assembled at 0H and 100H. The disk also includes a MENU program which creates a MONT.PRG program at any RAM memory location you desire. MENU compares the two files and can be used to relocate any assembly language program having identical LDA versions assembled at 0H (LOW) and 100H (HGH). It does not have a DS as its last statement.

The MONITOR disk is now available from your Compucolor dealer or from the factory for \$19.95.

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As a service to our readers, Compucolor Corporation publishes information sent to us by other manufacturers of products, techniques, or scientific and technological developments which can be used in conjunction with the Compucolor computer. However, in many cases, Compucolor Corporation has not had the opportunity to examine or test these products thoroughly. Therefore, we neither endorse nor assume any responsibility of liability for the proper functioning of products not directly manufactured by the Compucolor Corporation. We hope you will find these products of interest, but we encourage you to investigate carefully before you buy.

#### EDITOR'S NOTE

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Compuworld, Inc. announces the release of two business packages for use on the Compucolor. They are Accounts Receivable and Mailing List. Accounts Receivable will support 100 accounts and 500 invoices per disk side. AR will provide statements for all accounts with open invoices; invoice aging and account status; total monies owed for all accounts; and mailing labels by two parameters. Accounts Receivable is available for \$150.

#### COMPUWORLD ANNOUNCES ACCOUNTS RECEIVABLE & MAILING LABEL PACKAGES

The Mailing List package allows entry, correction, and deletion capabilities. You can print your labels according to a wide variety of parameters. The Mailing List is available for \$75.

Both packages run on a 32K Compucolor and do not require special keyboards, lower case or add-on drives. To order in New York State, add 7% Sales Tax. Dealer inquiries welcome. For further information contact:

Compuworld, Inc.  
125 White Spruce Boulevard  
Rochester, N.Y. 14623  
(716) 473-5790

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**MICRO DATA BASE SYSTEMS  
RELEASES SOFTWARE FOR  
THE COMPUCOLOR**

Jerry Kidd from Micro Data Base Systems, Inc. has written saying:

"Available now for the Compucolor 16K+ is F.R. Ruckdeschel's Instrument Flight Training Program, Tax Program (1040A only), Dictionary Listing with String Search Programs (a particularly useful tool for those who write educational programs), IQ Builder Kit, Basic Grammar Kit, Basic Algebra Kit (the kits are continually being expanded), Word Scramble Drills and some interesting new games; Golf (play some of the best courses in America), Space Pilot (fly assorted spacecraft in combat), Stockmarket, Super Hammurabi, and other programs."

A free brochure is available from:

Micro Data Base Systems, Inc.  
P.O. Box 248  
Lafayette, Indiana 47902

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## input

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### NO CHEATERS!

John Johnson  
561 W. Enid Avenue  
Mesa, Arizona 85202

After playing "Acey Ducey" on the Chess diskette for awhile and being a naturally curious person, I tried inputting a seemingly illegal value for a bet with some interesting results. It appears that the program will accept a negative bet and if the bet loses, the negative value is subtracted from your score, in effect, adding to your total. If you are like me, when I get frustrated after losing a lot and I know of a way to "fudge" a bit, I will use it. To resist this temptation, I modified the program by adding the following lines:

```
666 IF M>=0 THEN 670
667 PLOT 3,0,30,11,3,0,30:PRINT "HA,HA! YOU CAN'T DO THAT
    ANYMORE."
668 FOR I=1 TO 1000:NEXT:PLOT 3,0,30,11:GOTO 650
```

This will not allow values less than 0 and will remind you that "cheaters never prosper", well not anymore anyway!

=

Tom Coughlin  
c/o Elliott, Powell,  
Baden & Baker, Inc.  
1521 S.W. Salmon Street  
Portland, Oregon 97205

Tom Coughlin is working in the life insurance business and is specifically interested in locating general business software and software developed for use in the insurance business. Please contact him if you have any information.

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Instructions for the complete use of the COP command for CCII, V6.78 software. The Copy Command does not allow the user to copy from the default drive to the other drive. This situation is true regardless of which drive is the default drive.

## THE COPY COMMAND

Richard Manazir  
13 Grandview St.  
Southwick, Mass 01077

When drive 0 is the default drive, files can be copied from drive 1 to drive 0. To copy files from drive 0 to drive 1, do the following:

```
ESC D (Enter FCS)
FCS> DEV 1:
DEFAULT DEVICE= CD1:
FCS> COP 0:filename.type(;version) TO 1:
```

Use the same process when the default drive is drive 1.

(If the destination device is not stated, then the destination device is the default device.)

## EDITOR'S NOTE

This method is quite simple and eliminates the need for using external programs such as COPY on the Sampler disk.

Also programs can be loaded from drive 1 when drive 0 is the default drive (this pertains to programs written in BASIC). Simply type:

```
LOAD "1:filename" or
LOAD "0:filename"
```

The same holds true for the SAVE command.

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This article adds more information to the ATTN/BREAK article in the February **COLORCUE**, which told how to avoid printing extraneous lower-case "y"s when using a printer with a hardware handshaking modification installed on the Compucolor II by using OUT 8,4 to disable the keyboard. Here are some additional hints:

## FURTHER HINTS ON PRINTER PROBLEMS

Edgar W. Swank  
5515 Spinnaker Drive, #4  
San Jose, California 95123

1. Despite the previous article, it IS possible to enable the keyboard to accept an ATTN/BREAK occasionally without affecting printed output.

You now get to use the BASIC command you haven't used yet, I'll bet. Before you enable the keyboard, you must wait for the printer handshake line to quiesce. You can do this by issuing in BASIC:

```
WAIT 1,128,128:OUT 8,255
```

Of course you must issue OUT 8,4 before sending any more data to the printer.



2. OUT 8,4 will NOT WORK if you issue any BASIC FILE commands FILE, GET, PUT, or LOAD/SAVE) while the printer is active. That is because these commands, for some reason, override your OUT 8,4 and re-enable the keyboard. Fortunately, you can overcome this problem by issuing WAIT 1,128,128 BEFORE any file commands, and OUT 8,4 again before sending any more printer data.

3. Be sure to press CPU RESET before entering ESC G when you want to use DIR to print a directory. This ensures that keyboard input is directed to the screen, while FCS output goes to the printer. The "y"s from the handshake line will then appear on the screen, rather than on the printer. If you fail to press RESET, sometimes ESC G will cause both keyboard input and FCS output to be sent to the printer. NOTE: After RESET you may have to reset the BAUD RATE unless your printer can be set to 9600.

4. When you want to LIST a BASIC program, try the following procedure, which avoids the necessity of holding down two keys while the printer is active:

a. RESET the machine and LOAD the program to be listed. Set Baud Rate, if necessary.

b. Enter POKE 33289,<the line length of your printer>

c. Enter the following on ONE line:

```
PLOT 27,13:OUT 8,4:LIST:WAIT 1,128,128:PLOT 10,12:WAIT
1,128,128:POKE 33265,0
```

The PLOT 10,12 and the extra WAIT seem to be necessary to ensure that the last line is printed.

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**attn/break**

**COMMUNITY  
ACCESS  
BULLETIN  
BOARDS**

COMPLIMENTS OF PEOPLES' MESSAGE SYSTEM, SANTEE CA.

LAST UPDATED 03/07/80

\*24 MEANS 24-HOUR SERVICE

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# SPECIAL INVENTORY SURPLUS SALE

We had such a good response to our inventory sale in last month's issue of **COLORCUE** that we decided to offer these parts as well. These bargain prices can't be beat. You can take advantage of this sale by just filling in the quantity and making out a check or money order to Compucolor for the total amount. In Georgia, please add 4% sales tax.

ITEM	COST PER ITEM	QUANTITY
(#300010) .02 UF 1600V	.05	_____
1N4731	.10	_____
2N5771 PNP	.10	_____
(#110097) IC HEAT SINK	.10	_____
(#300055) 2,500 UF 15V	1.00	_____
3.3 ohm 2W	.05	_____
150 ohm 1/4W	.03	_____
4.3K 1/4W	.03	_____
NUTS PIX TUBE MOUNT	10/.10	_____
SPACE BAR TABS	.10	_____
LOGO CLIPS	.03	_____
FOCUS RESISTOR	.35	_____
TUBE SOCKET CLIPS	.07	_____
(#900033) YOKE CLAMP SCREW	10/.10	_____
4-40 X 7/8 X 7/8 BRASS HEX SPACER	.10	_____
(#200022) 680 ohm 1/4W RESISTOR	.03	_____
220 UF 16V	.15	_____
(#120067) 8-32 X 3/8 FLAT HEAD	10/.10	_____
.068 UF 250V	.10	_____
007-9817178 CONNECTOR	1.10	_____
(#200043) 39K 1/4W	.03	_____
(#600083) 6 PIN CONNECTOR	.10	_____
4 PIN CONNECTOR	.10	_____
10 UHY CHOKE	.10	_____
(#600013) 3 PIN TRANSISTOR SOCKET	.15	_____
(#500120) CRT CHIP 5027-000 UF9	2.00	_____
C1702A	2.00	_____
(#120049) POST NUT	.02	_____
(#120032) 10-32 X 1/2 FLAT HD SCREW	10/.10	_____
(#120041) 8-32 HEX NUT	.05	_____
(#110010) FUSE CLIP	.02	_____
(#120022) 4-40 X 3/4 TRUSS HD	10/.10	_____
4-40 X 3/4 PAN HD	10/.10	_____
8 X 3/4 HEX HEAD	10/.10	_____
(#110048) SPRING FUSE CLIP	2/.10	_____
(#500055) 81LS96	1.00	_____
ANSLEY 609-255	1.00	_____
(#120075) 6 X 3/16 SPACER	2/.10	_____
(#120059) 6-32 X 7/8 SCREW	10/.10	_____
(#120066) #10 WASHER FLAT	10/.10	_____
(#120062) 4-40 X 1/8 ROUND HEAD SCREW	10/.10	_____
(#200207) 1K 2W RESISTOR	.05	_____
EXPERIMENTAL CASE	5.00	_____
BELL FOR COMPUCOLOR	14.95	_____
MYSTERY PACKAGE (nuts, bolts, screws, transistors, capacitors, ICs, diodes, etc.)	5.99	_____
SURPLUS 8000 INTECOLOR COMPUTERS (without cards)	\$200 - \$600	_____



We still have a good quantity of the items listed on last month's inventory list.

	COST PER ITEM	QUANTITY
Assorted key caps and space bars (list the keys you need to the left of the quantity column.)	\$ .10	_____
Compucolor disk drive face plates	\$ .50	_____
1K 2W 10% resistors	\$ .05	_____
38,000 MFD 15 VDC capacitors	\$3.66	_____
610 MFD 15 VDC capacitors	\$1.99	_____
1100 MFD 100 VDC capacitors	\$1.48	_____
8700 MFD 40 VDC capacitors	\$1.46	_____
3500 MFD 30 VDC capacitors	\$1.46	_____
1702 EPROMS	\$2.00	_____

Of special interest -- motor speed controls and video blanking circuits (either separate or combined on one board). The motor speed control circuit locks disk speed at 300 rpm. Brand new, no warranty. Will not work with the formatter. Motor Speed Control without video blanking only \$30.00  
with video blanking \$35.00

375 RCA 8-track stereo recorder/players (without case) for sale. Look into this for mass storage, nothing beats it for the price. A really great buy at only \$5.00 each!

ADI Keyboards -- we will refund purchase price to the 1st person who interfaces this to the CCII! It can be done! The ADI has a detachable keyboard which presents the standard ASCII 4-level code. The keyboard keys are optically encoded by means of photo transistors, a light source, and shutters attached to the keys. There are no switches to wear out and the unit is RFI free. The keyboard does not provide 2-key rollover. \$25.00

These parts may be slightly used or be brand new surplus inventory -- they are guaranteed to work, and all parts are priced very low!

YOUR NAME: \_\_\_\_\_

ADDRESS: \_\_\_\_\_

MAIL TO:

Compucolor Corporation  
225 Technology Park/Atlanta  
Norcross, Georgia 30092  
Attn: Reclamation Department



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Atlanta, Georgia 30327

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- \_\_\_ Volume 2, Nos. 1, 2, 3 January-March 1979
- \_\_\_ Volume 2, Nos. 4, 5 April-May/June 1979
- \_\_\_ Volume 2, Nos. 6, 7, 8 August-November 1979
- \_\_\_ Volume 3, Nos. 1, 2, 3 Dec./Jan. - March 1980
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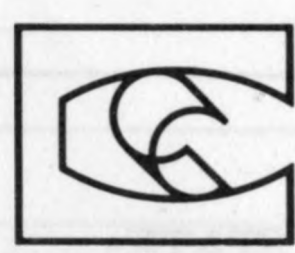
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- Volume 5, Nos. 1, 2, 3 October-December 1979
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